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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/682,096	10/08/2003	Edward G. Sergoyan	81013/7400	9217

22242 7590 10/05/2004

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EXAMINER	
ROGERS, DAVID A	
ART UNIT	PAPER NUMBER
2856	

DATE MAILED: 10/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	**Application No.** 10/682,096	**Applicant(s)** SERGOYAN, EDWARD G.
	Examiner David A. Rogers	**Art Unit** 2856

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 October 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

(a) The applicant uses the term "seals" throughout the specification to refer to those areas on a structure that must be watertight/airtight. It is recommended that the applicant considered using the term "regions", "areas", or another appropriate term. For example, on page 1, line 13 it would be better to have --of leaks through sealed regions--. In claim 1, lines 1-3 would be better written as --A method for use in detemining oif a sealed region leaks, comprising sealing a region; exposing the sealed region...."

(b) Page 1, line 34 replace --ware-- with --wear--.

(c) Page 13, line 20 replace --detection-- with --projecting--.

(d) Page 15, line 21 replace --182-- with --184--.

(e) Page 15, line 22 replace --191-- with --190--.

Appropriate correction is required.

Drawings

2. Figure 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated (see United States Patent 5,959,306). See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page

header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 3, 12, and 13 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by United States Patent 5,959,306 to Kalley *et al.*

Kalley *et al.* discloses a light source (see figures 1, 2, 5, and 6) for illuminating areas of possible leakage. Kalley *et al.* also discloses a detection filter (see figures 3 and 4) for use in detecting light at a second wavelength from the region of possible leakage. Kalley *et al.* also discloses a light source (figure 6) with a gasket (reference item 5A) that would be capable of sealing the light (reference item 10) from any fumes in the atmosphere.

In use a fluorescent material is added to a system such as a heating, ventilating, or air conditioning system. These systems are known to have fluid lines for transporting coolant or heating fluid. The fluid transporting means will be at a higher pressure than ambient external air. After adding the fluorescent dye the system will be pressurized and the fluid will travel throughout the system. Any regions of leakage, e.g. fittings, will be identified by the use of the light source and the detection filter.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claim 1 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by United States Patent Application Publication 2004/0118185 to Duerr.

Duerr teaches that it is known to perform leak testing on sealed regions on a vehicle or other sealed structure, e.g., slate roofs, mobile homes, or any other body intended to keep out environmental elements. Specific regions of testing include the region where the windshield and the frame are joined. In particular, Duerr teaches a method for locating leaks by utilizing a nozzle for spraying a fluorescent dye-based solution on a first surface, and locating the leaks on a second surface. The spraying of the fluorescent dye-based solution is taught as simulating actual operating condition of the vehicle, specifically high speed travel under storm-like conditions.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1-4 and 6-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent 4,976,136 to Willan in view of United States Patent Application Publication 2004/0118185 to Duerr and United States Patent 5,959,306 to Kalley *et al.*

Willan teaches that it is known to test aircraft by pressurizing the fuselage. In particular, Willan teaches that the fuselage is pressurized with a chlorofluorocarbon (Freon-22) to the aircraft's operating pressure. Once pressurized the exterior of the aircraft is monitored using a portable gas detector, as seen in figure 5. An alarm is sounded whenever the gas detector senses the presence of the chlorofluorocarbon. Not only is the structure tested, but areas such as sealed doors are also inspected for leaks.

This process of Willan has significant drawbacks. First chlorofluorocarbons are not beneficial to the environment as is well known. Secondly, the operator will have to manually mark the areas that show leakage since the chlorofluorocarbon does not leave a trace residue, and the full extent of the leak may not be apparent. Finally, the entire structure will have to be inspected using one or more gas sensors by manually moving the sensors across the entire aircraft.

Duerr teaches that it is known to perform leak testing on sealed regions on a vehicle or other sealed structure, e.g., slate roofs, mobile homes, or any other body intended to keep out environmental elements. Specific regions of testing include the region where the windshield and the frame are joined. In particular, Duerr teaches a method for locating leaks by utilizing a nozzle for spraying a fluorescent dye-based solution on a first surface, and locating the leaks on a second surface. The spraying of the fluorescent dye-based solution is taught as simulating actual operating condition of the vehicle, specifically high speed travel under storm-like conditions.

Duerr, however, does not teach the testing for leaks on an aircraft. Aircraft, being routinely subjected to maintenance, pressurization cycles, flight turbulence, flight loads, ground loads, etc., will over time develop leaks in the structure. This can be due to metallic corrosion, fatigue, embrittlement of sealing materials, foreign object damage, etc. It is also known to pressurize aircraft in order to detect leaks.

By modifying the teachings of Willan to spray the fluorescent dye-based solution on the interior of the aircraft, before or after pressurization, one would be able to get a clear, marked indication on the exterior of the aircraft where leaks are present. Being fluorescent one can easily use a light source, as disclosed by Duerr or by Kalley *et al.*, to view large portions of the structure from a distance, and performing closer examination on only those areas that show fluorescent dye-based solution on the surface. Furthermore, being a water-based liquid, the fluorescent dye-based solution will show the full extent of the leak, even after the water has evaporated. Furthermore, opening the doors and other sealed regions, e.g., access panels, one will be able to inspect the inner surfaces that were not immediately visible on the exterior. This will show those regions that were leaking, but where the fluorescent dye-based solution did not reach the external surfaces.

Kalley *et al.*, as noted above, discloses a light source (see figures 1, 2, 5, and 6) for illuminating areas of possible leakage. Kalley *et al.* also discloses a detection filter (see figures 3 and 4) for use in detecting light at a second wavelength from the region of possible leakage. Kalley *et al.* also discloses a light source (figure 6) with a gasket (reference item 5A) that would be capable of sealing the light (reference item 10) from any fumes in the atmosphere.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Duerr with the teachings of Willan and Kalley *et al.* to inspect a structure, especially a sealed structure on an aircraft, for leaks using a fluorescent dye-based solution sprayed on the interior of the aircraft.

9. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Willan in view of Duerr and Kalley *et al.* as applied to claims 1 and 4 above, and further in view of United States Patent 5,404,747 to Johnston *et al.*

Willan in view of Duerr and Kalley *et al.* teach the testing of a pressurized structure using a fluorescent dye-based solution that will pass through leaks in sealed regions. Willan in view of Duerr and Kalley *et al.* does not teach the altering of atmospheric pressure on only a portion of the seal.

Johnston *et al.* teaches that it is known in the art to test seals for leaks around doors and hatches of aircraft. Johnston *et al.* specifically teaches that it was known to fully pressurize the aircraft prior to performing leak testing. In order to eliminate the need to fully pressurize the aircraft, Johnston *et al.* teaches the use of a system to leak test only a sealed region, as shown in figure 3. This eliminates the need to fully pressurize the aircraft. Davey teaches a smaller variant of the apparatus of Johnston *et al.* Here the apparatus covers only small region on the structure prior to testing for leaks.

Testing by altering the atmospheric pressure on only a portion of a sealed region would have been obvious in view of the teachings of Johnston *et al.* and Davey. If the structure was modified at only a small area, e.g., installation of a connector that passed through the bulkhead, then it would be preferred to test only that small region for leaks vice the full structure thus saving time.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Willan in view of Duerr and Kalley *et al.* with the teachings of Johnston *et al.* and Davey to test a portion of a sealed region for leaks by altering the atmospheric conditions on only that portion of the sealed region.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(a) United States Patent 4,373,862 to Ferris *et al.* teaches the detecting of leaks/cracks in the structure (blade) of an aircraft using a fluorescent dye-based solution inside the blade.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David A. Rogers whose telephone number is (571) 272-2205. The examiner can normally be reached on Monday - Friday (0730 - 1600).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron E. Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dar
28 September 2004

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